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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/646,343	09/18/2000	Sumi Tanaka	197310US2PCT	8744

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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER
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MOORE, KARLA A

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 02/13/2003

10

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/646,343

Applicant(s)

TANAKA ET AL.

Examiner

Karla Moore

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:  
  
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
2. Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claims 1-16 all recite, "the processing gas forming a thin film on the target object mounted on the mounting table"—a method limitation; however, the claims are apparatus claims. Examiner is unclear on whether the claimed apparatus must necessarily form a thin film on the target object mounted on the mounting table OR must only be capable of forming a thin film on the target object mounted on the mounting table. Clarification is requested.
4. Claims 5, 8 and 15 are rejected under 35 U.S.C. 112, third paragraph, as failing to further limit the claims from which they depend.
5. Similar to the other claims of the invention, the claims are drawn to an apparatus. However, the additional limitations provided by the claims appear to be drawn to a method for using the apparatus, not the structure of the apparatus. The claims fail to further structurally limit the claims from which they depend.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:  
  
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claims 1-4, 6, 8-14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,304,248 to Cheng et al. and further in view of U.S. Patent No. 5,383,971 to Hayakawa et al.

8. Cheng et al. disclose a film deposition apparatus in Figure 5 substantially as claimed and comprising: a container (2) forming a process chamber for processing a target object (10); a mounting table (40) which is provided in the processing chamber and on which the target object is mounted; a first gas supply provided in the container, for supplying processing gas into the processing chamber, the processing gas forming a thin film in the target object mounted on the mounting table (20), a movable clamp (50) for clamping an edge portion of the target object and holding the target object on the mounting table; a first gas flow path (upwards arrows) formed between the mounting table and a support (70/76) provided for the clamp means; a second gas flow path (gas flows through gap and back down other side of support) formed between the clamp and the support when the clamp is moved to a position where the clamp clamps the target object; and a second gas supply section (16) for causing backside gas to flow into the first and second gas flow paths.

9. With respect to claim 2, the first and second gas flow paths extend so as to pass the edge portion of the target object clamped by the clamp. Examiner notes that the gas flow patterns shown are representative of a path a gas molecule may follow. Although as shown, a gas molecule following the second path may appear not to pass the edge portion of the target object, because the gas molecules have a random motion, a molecule which ultimately follows the second path may also pass the edge portion of the target object at some point.

10. With respect to claims 4 and 14, the backside gas acts as a film-depositing prevention gas for preventing the processing gas from diffusing around the edge portion of the target object (column 7, rows 9-21).

11. With respect to claim 6, the backside gas is constituted of inert gas (column 6, rows 64-66).

12. With respect to claim 8, which is drawn solely to processing gases for an intended operation, it has been held that expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining the patentability of the apparatus claim. *Ex Parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969).

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13. With respect to claim 9, the apparatus further comprises a buffer section for controlling conductance of the gas flow path (large square area, below clamp, to right of susceptor lift, and to left of support).

14. With respect to claim 11, the clamp is shaped like a ring and clamps all of the edge portion of the target object against an inner portion thereof (see Figure 4).

15. With respect to claim 12, the inner edge of the portion of the clamp (54), against which the target object is clamped, has a tapered surface which is brought into line contact with the target object (see Figure 7; column 6, row 57 through column 7, row 8).

16. However, Cheng et al. fail to specifically disclose the heating means of the apparatus.

17. Hayakawa et al. disclose a film deposition apparatus in Figure 2, comprising: a second heating apparatus (17b) formed in a support structure for the clamp (16a) and arranged opposite the clamp, for heating the clamp for the purpose of maintaining the substrate (8) and the vicinity thereof at a constant temperature (abstract). Hayakawa et al. further disclose a heater (14) located in the substrate holder for the purpose of heating and maintaining the whole of the interior of the chamber at a predetermined temperature (column 3, rows 15-19).

18. It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to have provided a first heating apparatus located in the substrate support in Cheng et al. in order to heat and maintain the whole of the interior of the chamber at a predetermined temperature as taught by Hayakawa et al. and to have provided a second heating apparatus in a support structure for the clamp in Cheng et al. in order to maintain the substrate and the vicinity thereof at a constant temperature as taught by Hayakawa et al.

19. With respect to claims 3 and 13, Examiner notes that without insulation all structures in the vicinity of the substrate will be heated, either indirectly or directly, by all heating structures which are positioned in the vicinity. In Hayakawa et al. the vicinity of the substrate is viewed as all structures illustrated in Figure 2.

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20. With respect to claim 10, Hayakawa et al. teach the use of a control section (a cooling water supply pipe, 19). Cooling water supply pipes are provided in the invention for the purpose of maintaining a constant temperature condition (column 3, rows 25-27 and column 4, rows 16-19).

21. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a control section in the prior art in order to maintain a constant temperature condition as taught by Hayakawa et al.

22. Claims 5 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of Cheng et al. and Hayakawa et al. as applied to claims 1-4, 6, 8-14 and 16 above, and further in view of U.S. Patent No. 5,705,223 to Bunkofske.

23. Cheng et al. and Hayakawa et al. disclose a film deposition apparatus as described above.

24. However, Cheng et al. and Hayakawa et al. fail to disclose a backside gas, which can be used as a cleaning gas.

25. Bunkofske teaches the use of a backside gas used as a cleaning gas for the purpose of removing edge coating formed during deposition which can be detrimental to the manufacturing process and spread contamination to other wafers (column 1, rows 29-36; column 4, rows 47-51).

26. It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to have provided a backside gas able to act like a cleaning gas in the prior art in order to remove edge coating detrimental to the manufacturing process and capable of spreading contamination to other wafers as taught by Bunkofske.

27. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Cheng et al. and Hayakawa et al. as applied to claims 1-4, 6, 8-14 and 16 above, and further in view of U.S. Patent No. 5,551,982 to Anderson et al.

28. Cheng et al. and Hayakawa et al. disclose a film deposition apparatus as described above.

29. However, Cheng et al. and Hayakawa et al. fail to disclose a backside gas constituted of the same gas as part of gas components constituting the process gas.

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30. Anderson et al. teach the use of a backside gas constituted of the same gas as part of gas components constituting the process gas (column 8, rows 17-34) for the purpose of counteracting the dilution effect the backside gas may have on the process gas, especially at the peripheral portion of the target object, where the dilution effect may result in a non-uniform deposition across the surface of the wafer .

31. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a backside gas constituted of the same gas as part of gas components constituting the process gas in the prior art for the purpose of counteracting the dilution effect the backside gas may have on the process gas as taught by Anderson et al.

#### **Conclusion**

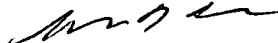
32. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 703.305.3142. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703.308.1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9310 for regular communications and 703.872.9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

km  
February 6, 2003

  
**BENJAMIN L. UTECH**  
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